

AMENDMENTS TO THE CLAIMS

Please amend the heading as follows:

CLAIMS

CLAIMS

Claims 1-3 (canceled)

4. (Currently amended) A method as claimed in claim 1 ~~where the~~ 68 wherein said up- conversion medium is excited by simultaneous absorption of two or more photons of the same or different energy.

5. (Currently amended) A method as claimed in claim 1 ~~where the~~ 68 wherein said up- conversion medium is excited by sequential absorption of two or more photons of the same or different energy.

6. (Currently amended) A method as claimed in claim ~~[[1]]~~ 68 wherein ~~[[the]]~~ said up- conversion medium is an up-conversion phosphor ~~designed to absorb that absorbs~~ long wavelength radiation and ~~to emit~~ emits light at shorter wavelength.

7. (Canceled)

8. (Currently amended) A method as claimed in claim ~~[[7]]~~ 68 wherein ~~[[the]]~~ said up- conversion medium is an electron-trapping phosphor.

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9. (Canceled)

10. (Canceled)

11. (Currently amended) A method as claimed in claim ~~[[1]]~~ 68 wherein ~~[[the]]~~ said up-conversion medium provides an up-conversion process ~~[[is]]~~ based on the excitation of lanthanide ions in an appropriate inorganic matrix.

12-16. (Canceled)

17. (Currently amended) A method as claimed in claim ~~[[1]]~~ 68 wherein ~~[[the]]~~ said solid phase is a glassy matrix, ~~e.g. as produced by a sol-gel process.~~

18. (Currently amended) A method as claimed in claim ~~[[1]]~~ 68 wherein ~~[[the]]~~ said solid phase is a crystalline matrix.

19. (Currently amended) A method as claimed in claim ~~[[1]]~~ 68 wherein ~~[[the]]~~ said solid phase is an organic or inorganic polymer.

20. (Currently amended) A method as claimed in claim ~~[[1]]~~ 68 wherein ~~[[the]]~~ said analyte causes a change in ~~the extent of binding~~ said proximity between ~~the solid phase of the~~ said energy donor species and ~~[[the]]~~ said energy acceptor species.

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21-24. (Canceled)

25. (Currently amended) A method as claimed in claim [[24]] 68 wherein [[the]] said surface of [[the]] said solid phase has bound thereto recognition ligands selected from the group consisting of antibodies, lectins oligonucleotides, nucleic acids, biotin, streptavidin, avidin and other proteins or other recognition ligands bound to it.

26-45. (Canceled)

46. (Currently amended) A method as claimed in claim [[1]] 68 wherein ~~the up-conversion medium gives rise to~~ said energy donor species emits light in two or more luminescence emission peaks ~~which are differently affected by binding of an energy that~~ differ in efficiency of energy transfer to said energy acceptor species and where wherein measurements of emission at ~~two or more~~ wavelengths characteristic of these at least two such peaks are combined by ratio or otherwise to effect a measurement of the analyte made.

47.-56. (Canceled).

57. (Currently amended) A method as claimed in claim [[1]] 68 wherein the solid phase is provided with a continuous, discontinuous or partial coating of a metal for enhancing transfer of energy [[form]] from the upconversion medium to the acceptor species.

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58. (Currently amended) A method as claimed in claim 57 wherein ~~analyte recognition molecules are provided and are capable of directly or indirectly binding the acceptor species in close or immediate proximity to the metal~~ the solid phase has bound thereto recognition ligands selected from the group consisting of antibodies, lectins oligonucleotides, nucleic acids, biotin, streptavidin, avidin and other proteins bound to said metal.

59. (Currently amended) A method as claimed in claim ~~[[58]]~~ 57 wherein the metal coating is discontinuous and ~~the analyte recognition molecules~~ recognition ligands selected from the group consisting of antibodies, lectins oligonucleotides, nucleic acids, biotin, streptavidin, avidin and other proteins are bonded to the solid phase at discontinuities in the metal coating.

60.-67 (Canceled)

68. (New) A method of detecting or quantifying an analyte by means of luminescence assay based on detection of transfer of energy between an energy donor species and an energy acceptor species as an acceptor of said energy, in which

(i) the energy donor species is an upconversion medium that affects a transition to an excited state by absorption of electromagnetic radiation having an energy less than that of said transition and is provided as a solid phase having a surface or is immobilised in a solid phase having a surface or is immobilised on a surface of a solid phase and

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(ii) said acceptor species is bound to the surface of said solid phase in proximity to the energy donor species, said acceptor species when so bound being excited by energy transfer from the said excited state of the donor species, the method comprising the steps of

(a) combining a sample potentially containing the analyte with the energy donor species and the acceptor species or a precursor thereof that is converted by the analyte to the acceptor species,

(b) irradiating said donor species with said electromagnetic radiation to excite the donor species to its said excited state for said energy transfer between the excited donor species and acceptor species bound to the surface, said analyte being one which provides the acceptor species bound to the surface in said proximity to the donor species or provides for displacement of bound acceptor species from said proximity thereby resulting in change in the excitation condition of at least one of the donor species and acceptor species; and

(c) detecting luminescence in at least one spectral region of the emission of said donor species or of said acceptor if said acceptor is luminescent, provided that the excitation of such a luminescent acceptor to a luminescent state emitting in said spectral region of the emission of the acceptor does not occur by absorption of a single quantum of the radiation used to excite the donor species.

69. (New) A method as claimed in claim 68 wherein said transfer of energy from said energy donor to said energy acceptor is detected by quenching of emission of said energy donor species or by sensitised emission of said energy acceptor species.

70. (New) A method as claimed in claim 68 wherein said transfer of energy from said energy donor species to said energy acceptor species is detected by a change in luminescence decay rate of said energy donor species.

71. (New) A method as claimed in claim 68 wherein said analyte mediates formation or dissociation of a bound complex between said energy donor species and said energy acceptor species.

72. (New) A method as claimed in claim 68 wherein said analyte catalyses formation or cleavage of a linkage between said energy donor species and said energy acceptor species.

73. (New) A method as claimed in claim 68 wherein said analyte interacts with said energy acceptor species or said precursor thereto causing a change in colour thereof or a change in fluorescence efficiency thereof.